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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/533,082	04/28/2005	Stefan Bitterlich	270624US0PCT	2316
22850 7590 01/05/2007 OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER CHEUNG, WILLIAM K	
			ART UNIT	PAPER NUMBER
			1713	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		01/05/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

# Office Action Summary

Application No.

10/533,082

Applicant(s)

BITTERLICH ET AL.

Examiner

William K. Cheung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 29 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 051805.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 (line 1), the recitation "a process for preparing oligomers" is considered indefinite because claim 1 (line 16-21) does not indicate that the process as claimed is producing any oligomer.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pierotti et al. (US 6,440,885 B1) in view of Rath (US 5,910,550).

*The invention of claims 1-9 relates to a **process for preparing oligomers** consisting mainly of repeating units derived from **1- or 2-butene** from a **hydrocarbon stream** consisting substantially of **branched and linear hydrocarbon compounds** having **4 carbon atoms**, and comprising **olefinic branched and linear hydrocarbon compounds having 4 carbon atoms** (C<sub>4</sub> starting stream) by:*

*a. **separating the C<sub>4</sub> starting stream into a fraction** consisting mainly of linear hydrocarbon compounds having 4 carbon atoms (1- C<sub>4</sub> fraction) and a fraction consisting mainly of branched hydrocarbon compounds having 4 carbon atoms (b- C<sub>4</sub> fraction), by **contacting the C<sub>4</sub> starting stream with a membrane which is easier to pass for linear hydrocarbon compounds having 4 carbon atoms than for branched carbon compounds having 4 carbon atoms**;*

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- b. optionally after removing butanes, oligomerizing the olefinic hydrocarbon compounds having 4 carbon atoms present in the 1- C<sub>4</sub> fraction;*
- c. **subjecting the olefinic hydrocarbon compounds having 4 carbon atoms present in the b- C<sub>4</sub> fraction to one of the following steps:***
  - c1. **reaction with methanol to give methyl tert-butyl ether;***
  - c2. **hydroformylation to give substantially isovaleraldehyde;***
  - c3. **polymerization to polyisobutylene;***
  - c4. **dimerization to 2,4,4-trimethyl-1-pentene; and***
  - c5. **alkylation, substantially to form saturated hydrocarbon compounds having 8 or 9 carbon atoms.***

Pierotti et al. disclose a zeolite membrane (claim I) and the use thereof for separating linear and branched hydrocarbon compounds with 4 carbon atoms (col. 7, line 61, and col. 8, line 33).

The difference between the invention of claims 1-9 and Pierotti et al. is that Pierotti et al. do not teach that the disclosed process would lead to the formation of oligomers. Further, Pierotti et al. are also silent on a subsequent step C that would lead to other products.

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Regarding the claimed "a process for preparing oligomers" of claim 1, since applicants' claims do not indicate anywhere that oligomers have been prepared, the examiner has a reasonable basis that the rejection in view of Pierotti et al. is adequate.

Since Pierotti et al. (col. 7, line 61, and col. 8, line 33) clearly disclose that isolation of butene, which is monomer, it would have been apparent to one of ordinary skill in art in the polymerization field to recognize that butene is monomer that can be used to prepare polybutene. When Rath discloses step (c3) of the present invention, namely polymerisation of isobutene to polyisobutylene (see D5, claim I), it would have been obvious to one of ordinary skill in art to incorporate the polymerization teachings of Rath to the end of the process teachings of Pierotti et al. to obtain the invention of claims 1-9, with the motivation by the expectation of success of preparing a polyisobutene (abstract), especially after reading both the disclosures to Pierotti et al. and Rath. In view of the 112 rejection set forth, the rationale for the instant rejection is adequate.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William K. Cheung whose telephone number is (571)

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272-1097. The examiner can normally be reached on Monday-Friday 9:00AM to 2:00PM; 4:00PM to 8:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David WU can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



William K. Cheung, Ph. D.

Primary Examiner

December 29, 2006

**WILLIAM K. CHEUNG**  
**PRIMARY EXAMINER**